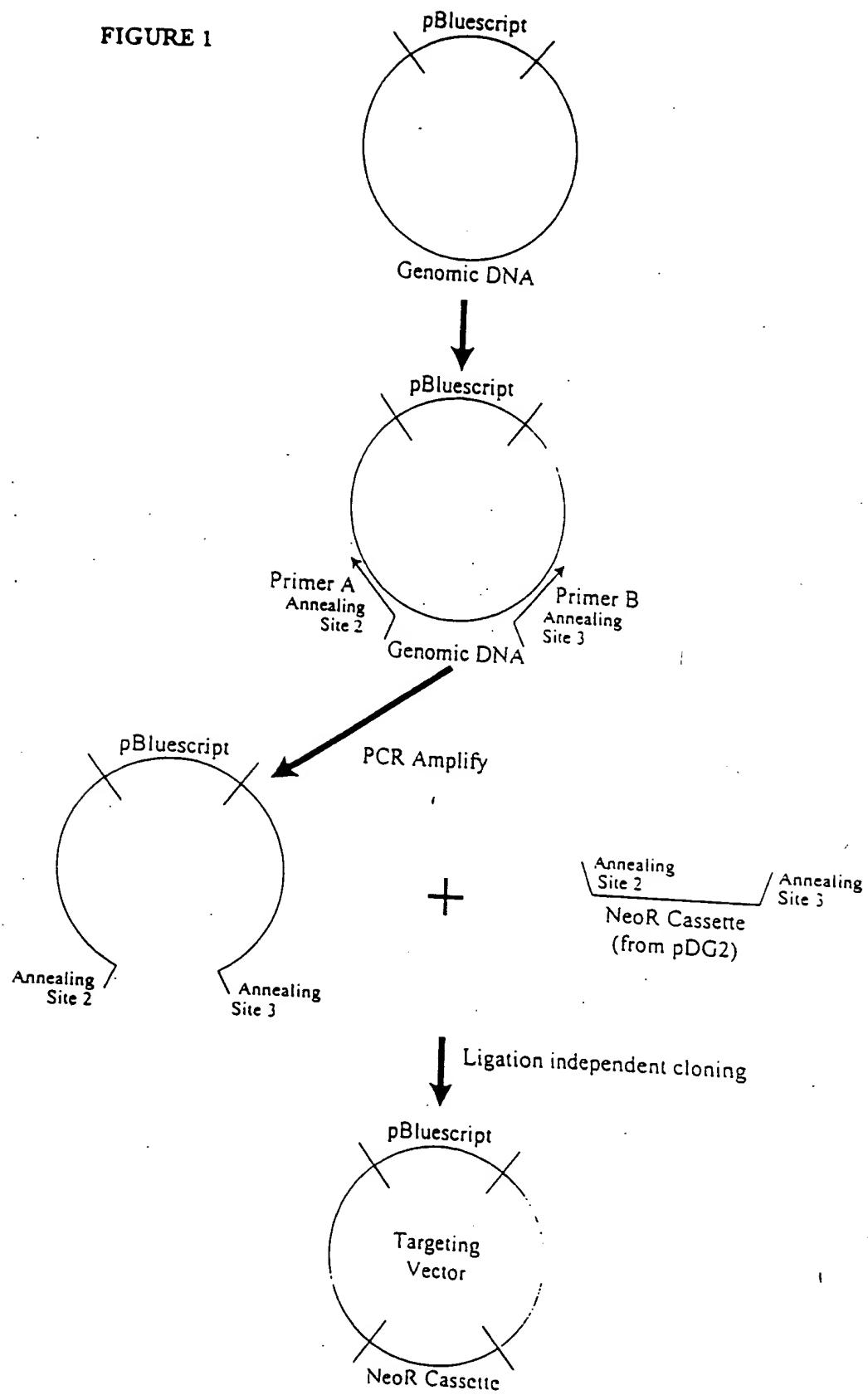


FIGURE 1



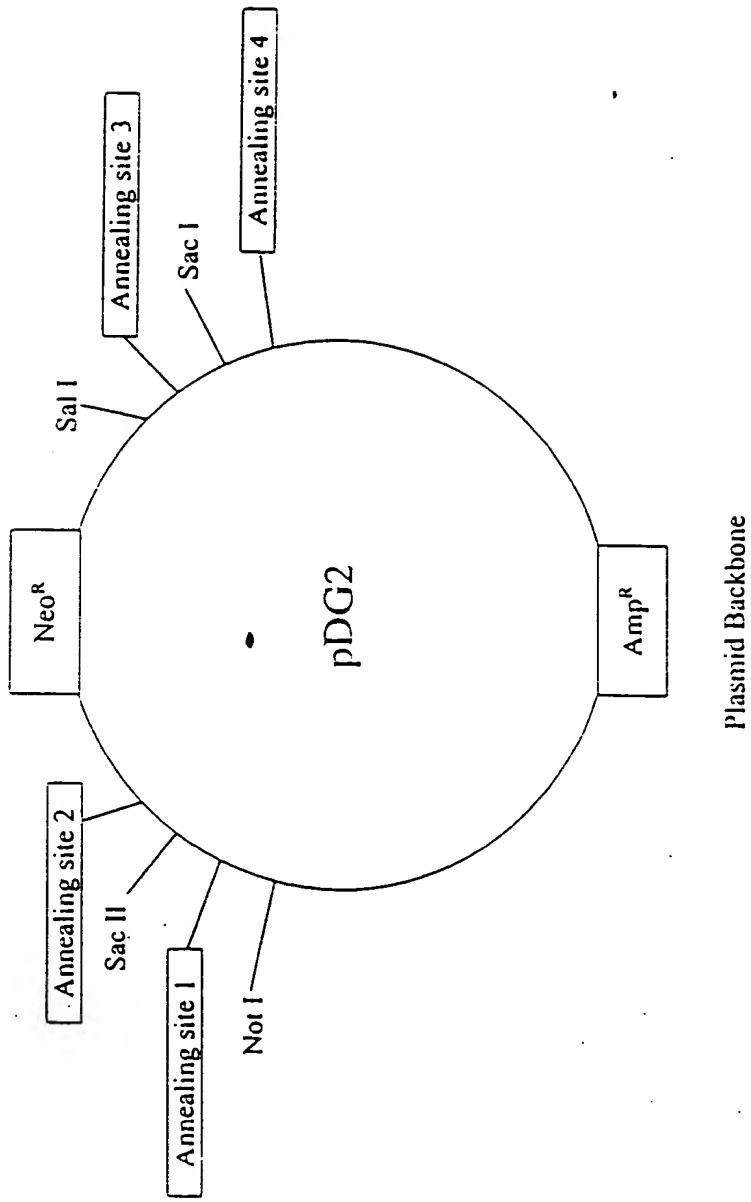


FIGURE 2A

FIGURE 2B

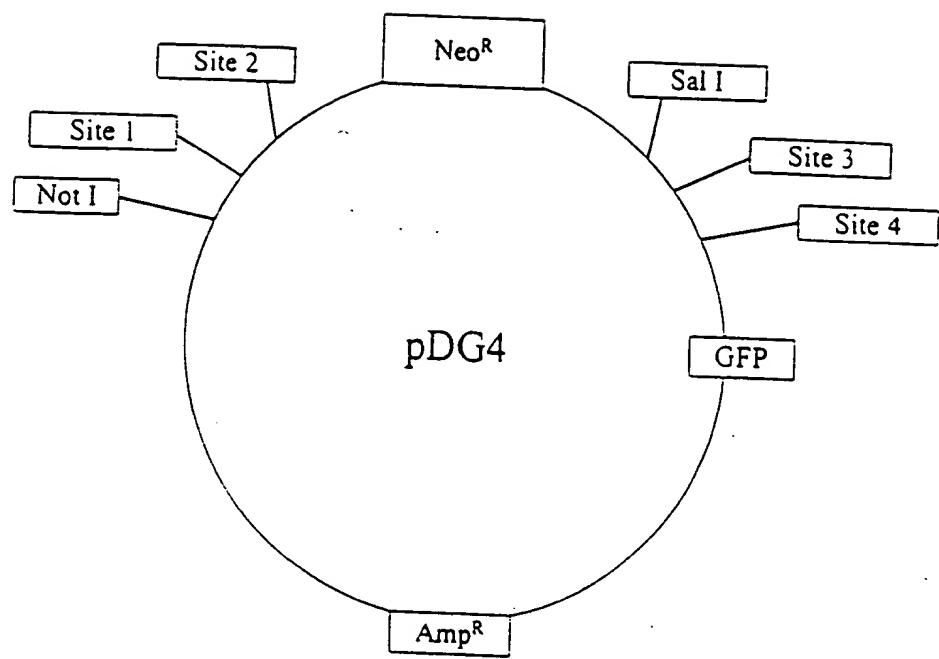


FIGURE 3A

FIGURE 3B

pDG4:

TGCTCTGCCGAGAAAGTATCCATCATGGCTATGCAATCGGGGGCTGCATACGCTTGATCCGGCTACCTGCCCATTCG
ACCAACCAAGCGAAACATCGCATCGAGCGAGCACGTACTCGGATGGAAGCCGTCTGCGATCAGGATGATCTGGACGAA
GAGCATCAGGGCTCGCGCAGCGAAGTTCGCCAGGCTCAAGGCCGCGATGCCCGACGGCGATGATCTCGTCGTGAC
CCATGGCGATGCCCTGCCAATATCGTGGAAAATGGCGCTTCTGGATTCTGACTGTGGCCGGCTGGGTG
TGGCGGACCGCTATCAGGACATAGCGTTGGCTACCCGTGATATTGCTGAAGAGCTTGGCGGGAATGGGCTGACCGCTTC
CTCGTGTCTTACCGTATCGCGCTCCGATTCCGAGCCATGCCCTCTATGCCCTTCTGACGGAGTTCTCTGAGGGGA
TCGATCCGTCTGTAAGTCTGAGAAATTGATGATCTATTAACAATAAAAGATGTCACACTAAATGGAAGTTTCTGT
CATATTTGTTAAGAAGGGTGAGAACAGAGTACCTACATTTGAATGGAAGGATTGGAGCTACGGGGTGGGGTGGGGT
GGGATTAGATAAAATGCCCTGCTTTACTGAAGGCTTTACTATTGCTTATGATAATGTTCATAGTTGGATATCATAA
TTAAACAAGCAAAACAAAATTAAGGGCCAGCTTCCACTCATGATCTATAGATCTATAGATCTCGTGGGAT
CATTTGTTCTTGATTCCACTTTGTTCTAAGTACTGTGGTTCCAAATGTGTCAGTTCATAGCCTGAAGAAC
GAGATCAGCAGCTCTGTCACATACTTCAATTCTCAGTATTGTTGCAAGGCTAATTCCATCAGAAGCTGACTC
TAGATCTGGATCCGCCAGCTAGGCCGTCACCTCGAGTGTACGGTACCAAGGCTCTCGCTCTGTGTCCGTTGAGCTCG
ACGACACAGGACACGCAAATTAAATTAAAGGCCGCCGTACCCCTAGTCAGGCTTAAGTGAGTCGTATTACGGACTGG
CCGTGTTTACAACGTCGTACTGGAAAACCTGGCTACCCACTTAATGCCCTTGCGAGCACATCCCCCTTCGCC
AGCTGGCGTAATAGCGAAGAGGCCCGCACCGATGCCCTCCACAGTTGGCAGCCTGAATGGCGATGGCGCTTCGC
TTGTAATAAGCCGTTGGCGGGTTTTTTT

FIGURE 3B (Continuted)

50 50 50 50 50 50
n 50 50 50 50 50 50

Annealing site	Sequence	Sequence after digestion
1	5' tgtgctcctttggcttccaa... 3' 3' acacgaggagaaccgaacggtt... 5'	5' tgtgctcctttggcttccaa... 3' 3' tt... 5'
2	5' ctggttcttgcgttggccaa... 3' 3' gaccaagaacccggaaaccgggtt... 5'	5' ctggttcttgcgttggccaa... 3' 3' tt... 5'
3	5' ggtcctcgctctgtgtccgttggaa... 3' 3' ccaggaggacacaggcaactt... 5'	5' ggtcctcgctctgtgtccgttggaa... 3' 3' tt... 5'
4	5' ttgcgtgtcctgtgtcgtaacaggcgtt... 5' 3' aaacgcacaggacacaggcgtt... 5'	5' ttgcgtgtcctgtgtcgtaacaggcgtt... 5'

FIGURE 4

Annealing site	Sequence		Sequence after digestion	
1	5'	AATgtgtcctttggcttgcgtCCGC	3'	5' AA
	3'	Ttacacggaaaacccgaaacgg	5'	3' Ttacacggaaaacccgaaacgg
2	5'	AACTggttttgtctggcttggCCGC	3'	5' AA
	3'	Ttgaccaagaacagacggaaaccgg	5'	3' Ttgaccaagaacagacggaaaccgg
3	5'	AGgtccctcgctctgtgtccgttGAGCT	3'	5' AA
	3'	Ttccaggaggcagacacaggcaac	5'	3' Ttccaggaggcagacacaggcaac
4	5'	AAttgcgtgtgtcgtrcGAGCT	3'	5' AA
	3'	Ttaaacgcacaggacacaggcagc	5'	3' Ttaaacgcacaggacacaggcagc

FIGURE 5

FIGURE 6

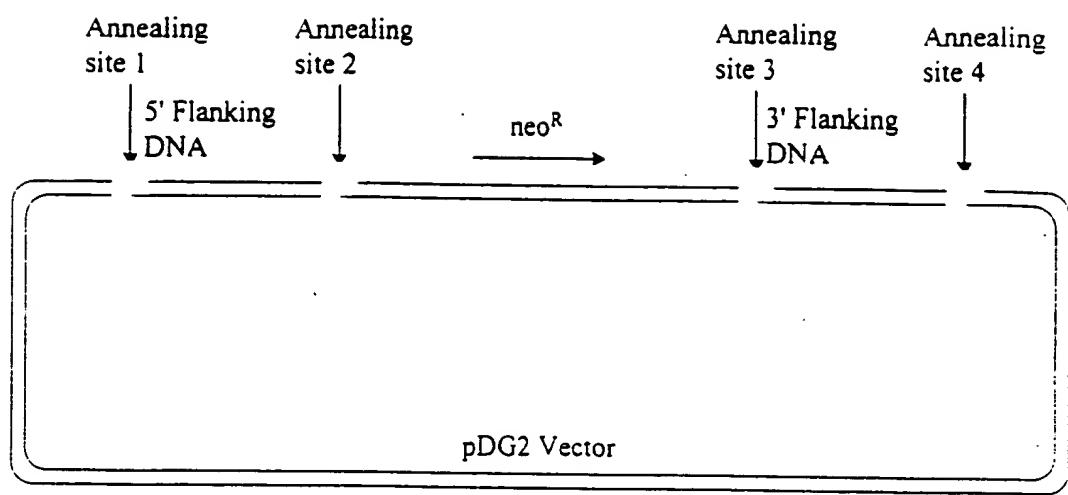


FIGURE 7

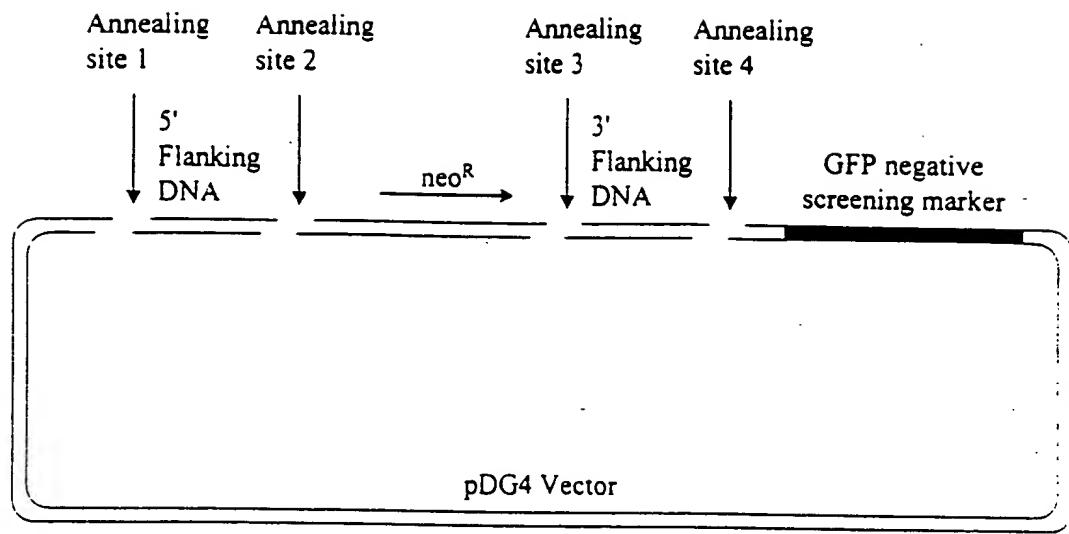


FIGURE 8

Oligo # Sequence (5' to 3')

174 ATGACCGCTCAGGAAACCTGTTGCA
180 ATAGGCATAGTAGGCCAGCTTGAGG

454 tggcctccctttggcttgcctccATTAAACCTCACTAAAGGAAACGAAT
463 ctggttttgtctggcttggccaaTGCAACAGGTTCTGAGCGGTAT

464 ggtcctcgctctgtgtccgttgaacCTCAAGCTGGCTACTATGCCAT
42 tttgcgtgtccctgtgtcgaaCGACTAATACGACTCACTATAGGGCG

151 GCCAATGGACTCTTAGTTTGGAAC
155 GTTCTGGCAAACAAATTGGCGCAC

454 tggcctccctttggcttgcctccATTAAACCTCACTAAAGGAAACGAAT
465 ctggttttgtctggcttggccaaGTTCCAAAACTAAGAGTCCATTGGC

466 ggtcctcgctctgtgtccgttgaatGCGCCGAATTGTTGCCAGAAC

1 GAACCTTGGTGTGCCAAGTTACTTC
2 GAACTTGGCTGAACCCCTTGTCT

41 tggcctccctttggcttgcgttgaacCGACTAATACGACTCACTATAGGGCG
38 ctggttttgtctggcttggccaaGAAGTAACCTGGCACACCAAGGTT

40 ggtcctcgctctgtgtccgttgaAGAACAAAGGGGTTCAGCCAAAGTT
37 tttgcgtgtccctgtgtcgAAATTAAACCTCACTAAAGGAAACGAAT

540 ATGCCGGATCTCCTACTACTGGGCC
546 TGTCAATAGACAGCGATGGAACG

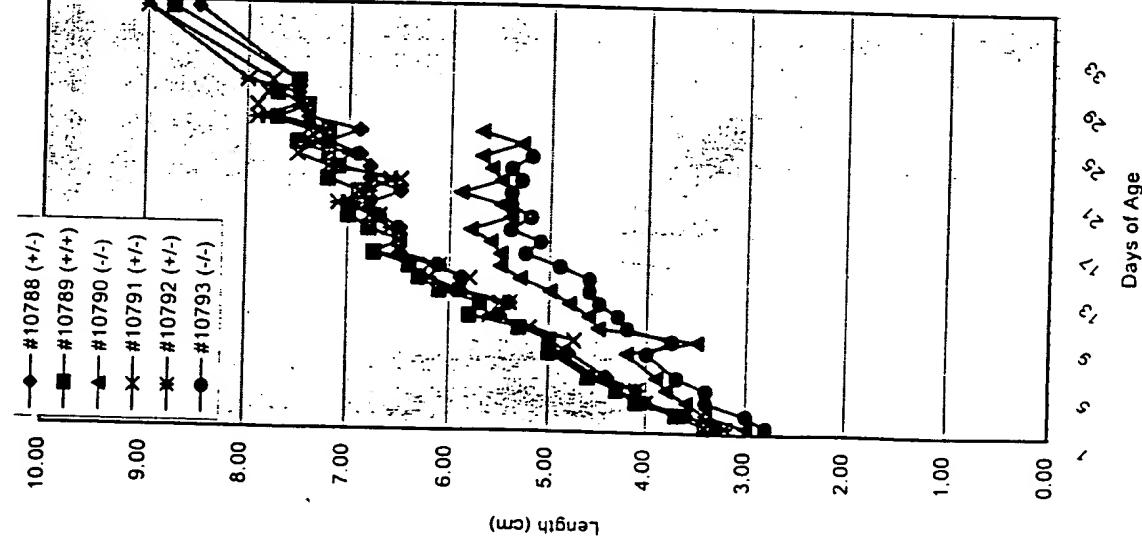
445 GACAAGAACCAAGTTGACGTCAAGCTTCCCAGCGCTGCTAGCGCGCGCG
667 ctggttttgtctggcttggccaaGGCCAGTAGTAGGAGATCCGGCAT

668 ggtcctcgctctgtgtccgttgaacCGTTCCATCGCTGTCTACTATGACA

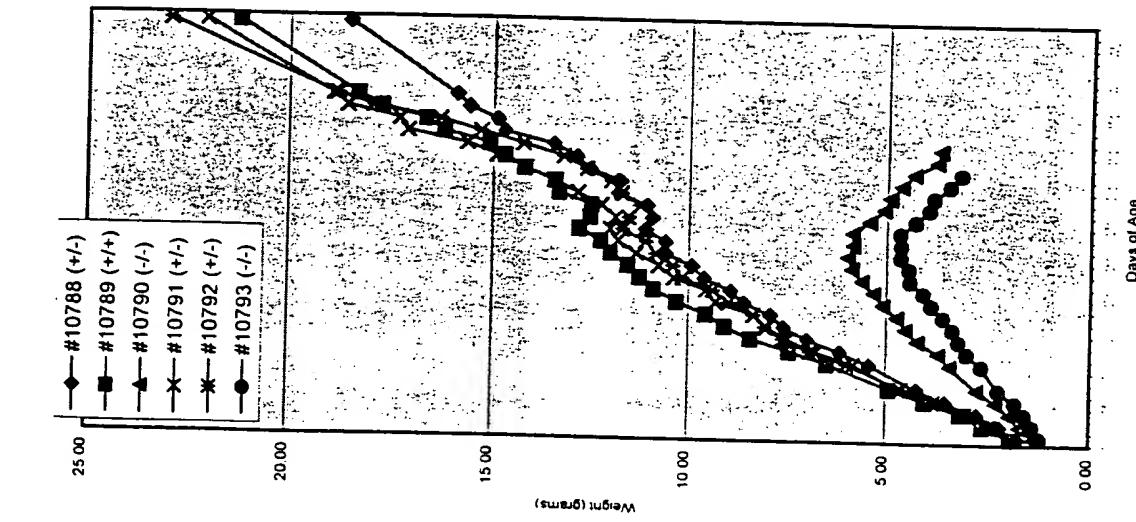
907 ctggttttgtctggcttggccaaAAAGCCGACAGCCACGCTCACAGC
908 ggtcctcgctctgtgtccgttgaacGCCAATGCCACAGAGAGAATGT

1157 ctggttttgtctggcttggccaaGTTGGATCCTCTCCAAGGCCCCATCT
1158 ggtcctcgctctgtgtccgttgaacCTCCAGTGCCAGTGTGTTGGGACAG

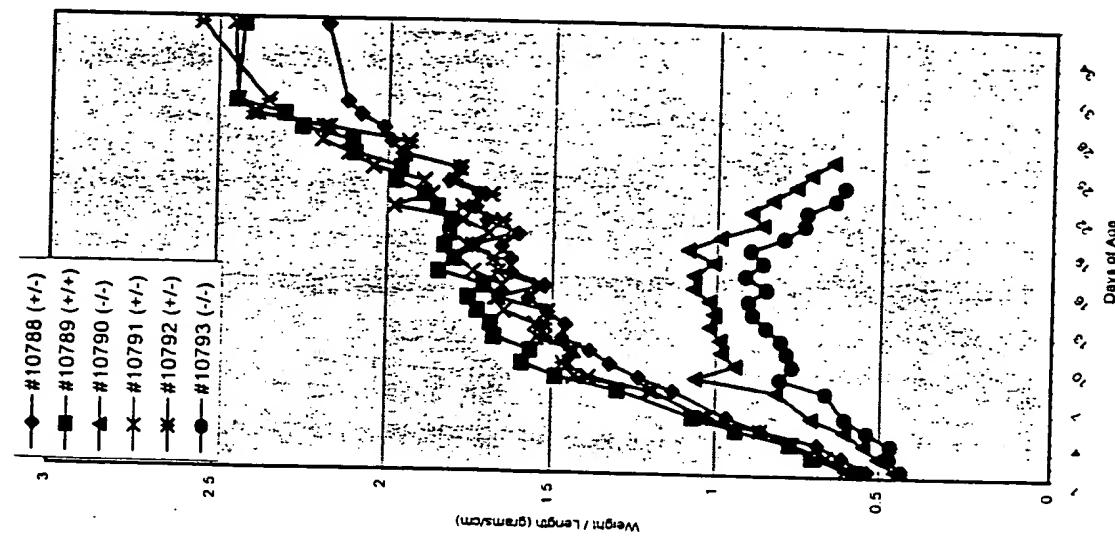
T243 ES242 Mating #1799
Progeny Lengths



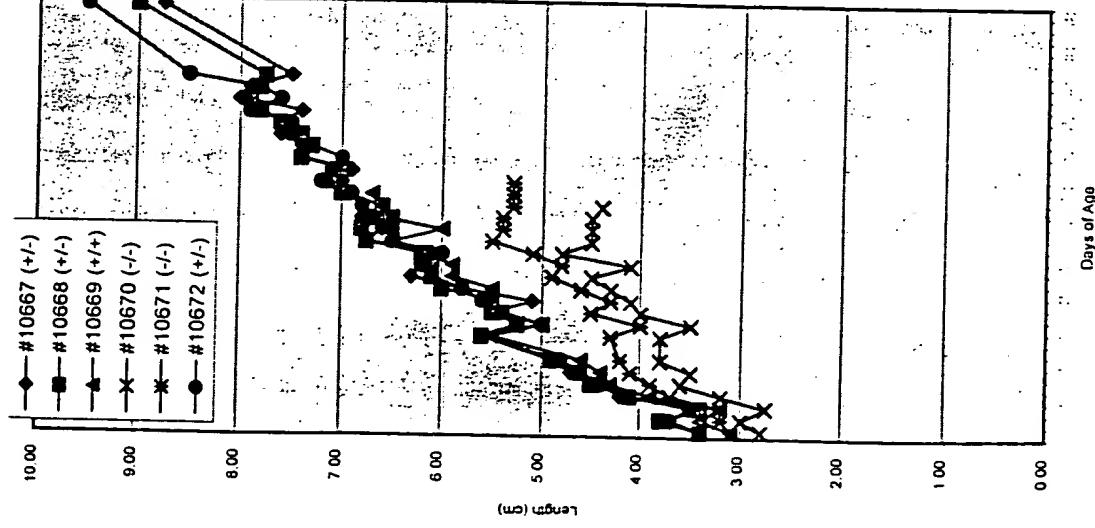
T243 ES242 Mating #1799
Progeny Weights



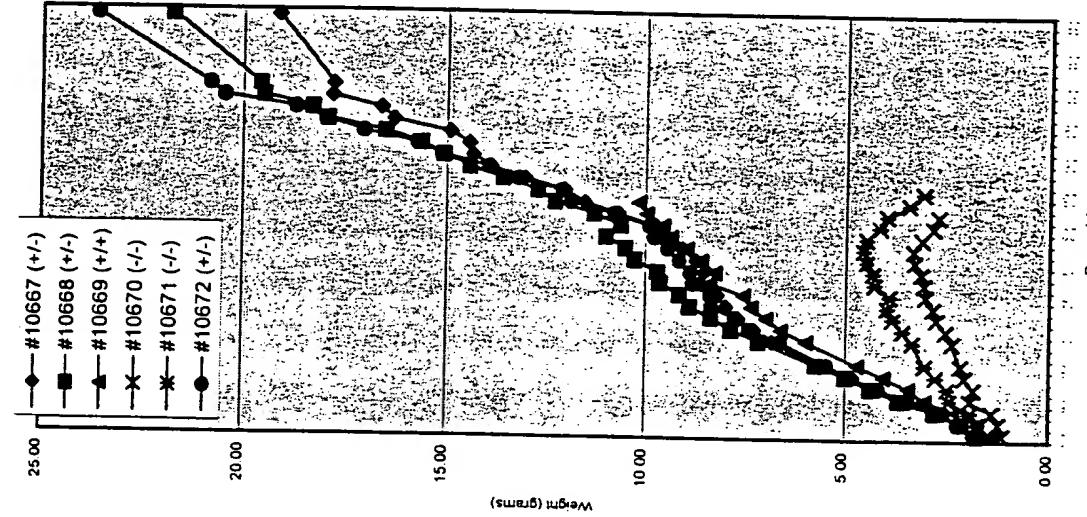
T243 ES242 Mating #1799
Weight / Length



T243 ES242 Mating #1808
Progeny Lengths



T243 ES242 Mating #1808
Progeny Weights



T243 ES242 Mating #1808
Progeny Weight / Length

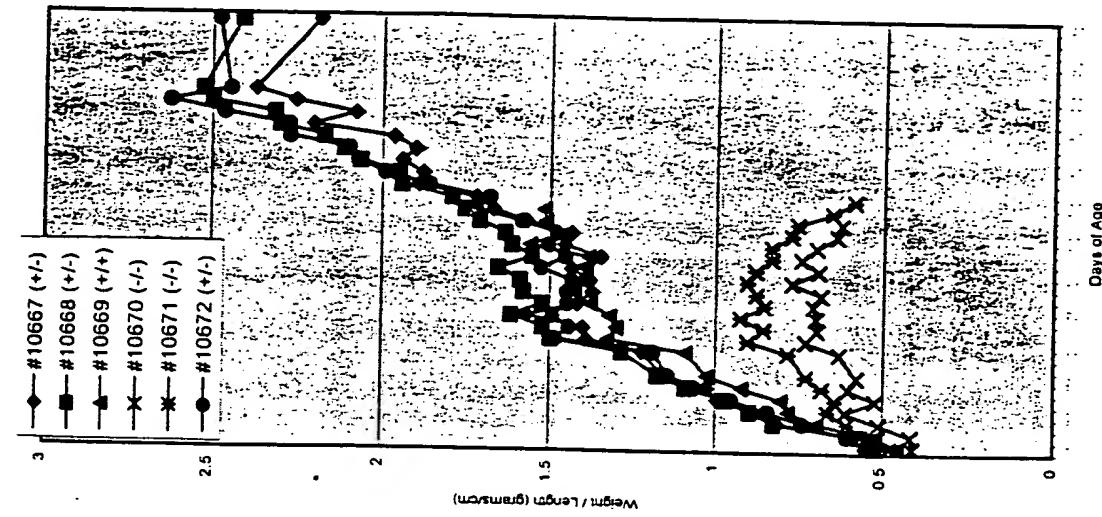


FIGURE 11

Mouse cDNA

GGCACGAGGGAGGAAGCGCCGCCGGTCCGCTCTGCTCTGGTCCGGCTGGCCATGGAGTCCATGTCTG
AGCTCGCGCCCCGCTGCCCTTATTTCCTTGCTGCTGCTGCTFCCGCTGCTGCCCTGCCGAA
GCTAGGCCGAGTCCCGCCGGGCTGAGGAGACCGACTGGGTGCGATTGCCAGCAAATGCGAAGTGTGC
AACTATGTTGCTGAGCTGAAGTCGGCTTGGAGAAACGGGAAAGACCAAGGAAGTGATTGACACCG
GCTATGGCATCCTGGACGGGAAGGGCTCTGGAGTCAGTACACCAAGTCGGACTTACGGTTAATTGAAGT
CACTGAGACACATTGCAAGAGGGCTCTGGACTACAGCCTGCACAAGGAGAGGACTGGCAGCAACGGTT
GCCAAGGGTATGTCGGAGACCTTGAGACGCTGCACAACCTAGTCCACAAAGGGTCAAGGTGGTATGG
ATATCCCCTATGAGCTGTGGAACGGAGACCTCAGCAGAGGTGGTCAAGTCAGAAGCAGTGTGACGTGCT
GGTGGAAAGAGTTGAAGAGGTATTGAGGACTGGTACAGGAACCACAGGAGGAAGACCTGACTGAATT
CTCTGTGCCAACCACGTGCTGAAGGGAAAGGACACGGAGTTGCCTAGCAGAGGGTGGTCTGGCAAGAAGG
GGGACATAGCCTCCCTGGAGGGAAAGAAATCCAAGAAGAAGCGCAGCGAGTCAGGGCTCCTCCAGTGG
CAGCAGCAAGCAGAGGAAGGGAACTGGGGGCTGGGGAGGATGCCAACGCGAGGAGGAGGGTGTG
CAGAAGGCATCGCCCTCCCACACAGCCCCCTGATGAGCTGTGAGCCAGCTAGTGTCCCTGAATCAA
GACCCCTGACTTCAGAGCTTGGGACACGCACAGCGCAGCGCAGCCAGCTCAGCAAGGACAGCTGCTGT
CCAGCATCAGGTCTCCTCCCTGGCTGTGCCCTTCCCTGAAACAACAGCAAGGAGTGGAAAGGAT
CTGGGGTGTGGAGACGGCACCCAAAGGGAAAGAGGAGGAGGAGCAGAAGGAGCTCTTACACA
GTCCCCCTCACGAGCTCCGGGTTCCACCCAGCATCCCCAGGCTGAGATCCAGGCTCTGACATGGAAGCT
GAAGAGCATGAGGCACATAAGATGTCACCAGCAGCCCCCTCAGCCAGGAAGGACTCCGTGAGCCTAG
CAGCCAGGCCTGCCTTCCCTCAGGAAAGGAGGAGGAGGAGCAGGAGCCACGCCAGAGACTG
AACTTCCAGGACAAACTCGGGTGTGGCACAAAGGGCTGGAGCAGGAGCCACGCCAGAGACTG
CAGAGAGGGCACCTGACCTAACCCCCCTGGAAAGGCAATCTGCAGTTCCCGTGTCCACCCACTCCTC
AGGACGCCTCATGCTCTGCCAGCCCTCTCCAGGGTACCGAGAGTAAACACCTTTGGCCTTCGGTT
TGGTTCCTGGTCCTCATCAGCCTCCAGAGTGTCCCCTCATCGATCTTTTGCCCTTGCCCCAATCC
CAGGGGCTGGAAGGCCATCACCATCATTGGAGGTTAACCTGTCAGTTACTAGGAGGTGCTGGAGGCC
CGGGGTTGGTTGGGTAATCACTCACTGGCTCTCAGCCTCTAACACTGCAGCCCCCTAACAGTTCC
TTCTGTTGTTGACTCCACGCCAACACACACCATAAAATTATTCGATGCTGTTCATTAACGT
AAAAAAAAAAAAAAAAA SEQ ID NO:47

Human cDNA

CGAGCCATGGATTCAATGCCTGAGCCCGCTCCGCTGTCTTCTGCTTCTTCCCTGCTGCTGCTGCTGC
TGCTGCTGCTGCCGCCGGAGCTGGGCCAGGCCAGGCGAGCTGAGGAGAACGACTGGGTCGCCT
GCCCAAGCAAATGCGAAGTGTGTAATATGTTGCTGTGGAGCTGAAGTCAGCCTTGAGGAAACCGGCAAG
ACCAAGGAGGTGATTGGCACGGGCTATGGCATCCTGGACCAGAAGGCCCTGGACTCAAATACACCAAGT
CGGACTTGCCTTAATCGAAGTCACTGAGACCATTGCAAGAGGCTCTGGATTATAGCCTGCACAAGGA
GAGGACCGGCAGCAATCGATTGCCAAGGGCATGTCAGAGACCTTGAGACATTACACAACCTGGTACAC
AAAGGGGTCAGGTGGTATGGACATCCCTATGAGCTGTGGAAAGAGTTGAGGAGGTATCGAGGACTGGTACGGAACCC
TCAAGAAGCAGTGTGATGTGCTGGTGGAAAGAGTTGAGGAGGTATCGAGGACTGGTACAGGAAACCA
GGAGGAAGACCTGACTGAATTCCCTGCGCCAACCACAGCTGCCCTGGAGGGAAAGTCCAAGAAGAACAGCA
GAGCAGTGGTCCGGCAAGAAGGGAGACACAGCTGCCCTGGAGGGAAAGTCCAAGAAGAACAGCA
GGCCAAGGCAGCAGGGCGAGGAGTAGCAGCAGCAAACAAAGGAAGGAGCTGGTGGCCTTGAGGGAGA
CCCCAGCCCCGAGGAGGATGAGGGCATCCAGAAGGCATCCCTCTCACACACAGCCCCCTGATGAGCTC
TGAGCCCACCCAGCATTCTGCTCTGAGACCCCTGATTTGAGCTGAGGAGTCAGGGCATGGCTCTG
GCAGGCCGGATGCCCGCAGCCTCAGCCCTCCTGCTGCTGTGCCCTTCTGCAAGGAAAG
ACACAAGCCCCAGGAAGAAACTCAGAGCCGTATGGTAGGCCACGCCCTTCCCTCCCCAAGTGT
TCTCTCTGACCCAGGGTTCAGGCAGGCCTGTGGTTCAAGGACTGCAAGGACTCCAGTGTGAACTCAGG
ACGGGCAGGTGTCAGAACTGGGACCAAGGACTGGAGCCCCCTCCGGAGACCAAAACTCACCACCCCTCAGT
CCTCCCCAACAGGGTACTAGGACTGCAGCCCCCTGTAGCTCCTCTGCTTACCCCTCTGTGGACACCT
TGCACCTGCCTGCCCTCCAGAGCCAAAGAGTAAAAATGTTGTTCTGAAAAA
AAAAAAAAAAAAAAAAAAAAA SEQ ID NO:57

FIGURE 12

MESMSSELAPRCLLFPLLLLPLLLPAPKLGPSPAGAEETDWVRLPSKCE
VCKYVAVELKSAFEETGKTKEVIDTGYGILDGKGSGVKYTKSDLRLIEVT
ETICKRLLDYSLHKERTGSNRFAKGMSSETFETLHNHLVHKGVKVVMMDIPYE
LWNETSAAEVADLKKQCDVLVEEFEVIEDWYRNHQEEDLTFLCANHVLK
GKDTSCLAERWSGKKGDIASLGGKKSKKRSGVKGSSSGSSKQRKELGGL
GEDANAEEEEGVQKASPLPHSPPDEL **SEQ ID NO:52**

MDSMPEPASRCLLPLLLLLLPAPELGPSQAGAEENDWVRLPSKCE
VCKYVAVELKSAFEETGKTKEVIGTGYGILDQKASGVKYTKSDLRLIEVT
ETICKRLLDYSLHKERTGSNRFAKGMSSETFETLHNLVHKGVKVVMIDIYE
LWNETSAAEVADLKQCDVLVEEFEVIEDWYRNHQEEDLTETFLCANHVLK
GKDTSCLAEQWSGKKGDTAALGGKKSSKKSSRAKAAGGRSSSSKQRKELG
GLEGDPSPEEDEGIQKASPLTHSPPDEL **SEQ ID NO:58**

卷之三

FIGURE 13

AGCTCAGACATGGACTCCATGGCCC SEQ ID NO:45
TGCATTGCCAGCAAATGCGAAGT SEQ ID NO:46

SEQ ID NO:48 Outward oligo 488 ctggttcttgcggctggcccaaAGCTCAGACATGGACTCCATGGCCC
SEQ ID NO:49 Outward oligo 489 ggtcctcgctctgtgtccgttgaatTGCGATTGCCAGCAAATGCGAAGT

primer 426 GGGCCATGGAGTCCATGTCTGAGCT **SEQ ID NO:55**
primer 432 ACTTCGCATTTGCTGGCAATCGCA **SEQ ID NO:56**

卷之三

FIGURE 14

5' of the deletion:

ACAGAAAAACAAGAAACAAAAACATGAAAGATAGTCTGTTATCCAGGGCTAGAATGCCAAGGCTGGTT
CATCCAAGGTATGATGAAGGTCAACCGCTAGGAACCTGATGCTCCAGCTACTGAGCCTCTTAGCTGGC
AGTGATATCGCTATAGGGCGCAAAGCCACCATCCGCTCTGATTGGGTGAGATGGGAAAAAAAAGA
TAGTTCCCTCTCATGGCTATAAAGCAGACGCCGAGCGAACCCATTGGTTGNGTCGCCGCCGGCCTTGGT
CGGTTTCGCAAGCCGCTAGAGGCTACCGGGCGAGGGGCGGGCCGGAGCTCGCCGTTGCCGTGGTTACCCA
GAGACACGTGCGCAGTCCCGGAAGCGGCCGGGGAGCTGCTCCGCGCGCTGCCGGAGGAAGCGCCGC
CGGGTCCGCTCTGCTCTGGGTCGGCTGGGCATGGAGTCCATGTCTGAGCT 3' SEQ ID NO:50

3' of the deletion:

FIGURE 15

Deletion generated by knockout

5'

CGGGCCCCGGTGCCTCTTATTCCTTGCTGCTGCTGCCCTCCGCTGCTGCTCCTGCCCTGGCCGAAGCTA
GGCCCGAGTCCCAGCCGGGCTGAGGAGACCGACTGGG 3' (SEQ ID NO:59)

Expanded T243

GGCACGAGGGAGGAAGGCCGCCGGTCCGCTCTGCTCTGGTCCGGCTGGCCATGGAGTCCATGTCTG
AGCT
GCT
GAAGTGTGCAAGTATGTGCTGCTGAGCTGAAGTCGGCTTTGAGGAAACGGAAAGACCAAGGAAGTGA
TTGACACCGGCTATGGCATCTGGACGGAAAGGGCTTGGAGTCAGTACACCAAGTCGGACTTACGGTT
AATTGAAGTCACTGAGACCATTGCAAGAGGCTCTGGACTACAGCCTGCACAAGGAGAGGACTGGCAGC
AACCGGTTGCCAAGGGTATGTCGGAGACCTTGGAGACCTGACAACCTAGTCCACAAAGGGTCAAGG
TGGTATGGATATCCCCTATGAGCTGGAACGAGACCTCAGCAGAGGTGGCTGACCTCAAGAACAGTGA
TGACGTGCTGGTGGAAAGAGTTGAAGAGGTGATTGAGGACTGGTACAGGAACCACCAGGAGGAAGACCTG
ACTGAATTCCCTGTGCCAACCACGTGCTGAAGGAAAGGACACGAGTTGCCAGCAGAGCGGTGGCTG
GCAAGAAGGGGACATAGCCTCCCTGGAGGGAAAGAACATCCAAGAAGAACGCCAGCGGAGTCAGGGCTC
CTCCAGTGGCAGCAGCAAGCAGAGGAAGGAACCTGGGGGCTGGGGAGGATGCCAACGCCAGGAGGAG
GAGGGTGTGAGAAGGCATGCCCTCCACACAGCCCCCTGATGAGCTGTGAGGCCAGCTTAGTGTCC
TTGAATCAAGACCCCTGACTTCAGAGCTTGGGACACGCACAGCGCAGCGCAGCTCCAGCAAGGAC
AGCTGCTGTCCAGCATCAGGTCTCCCTGGCTGTGCCCCCTTCCCTTGAACAACAGCAAGAGG
TGGAAAGGATCTGGGGTGTGGAGACGGCACCCAAAGGGAAAGAGGAGGAGGAGCAGAAGGCAGCTCT
TTCTACACAGTCCCCCTCACGAGCTCCGGGTCCACCCAGCATCCCCAGGCTGAGATCCAGGCTCTGAC
ATGGAAGCTGAAGAGCATGAGGCACATAAGATGCTCACAGCCCCCTTCAGCCAGGAAGGACTCCGTG
CAGCCTCAGCAGCCAGGCTGCCTTCCACCAAGCATTCTTCTGCTGGCTTGTGGATGGT
AAATTGAGAACTTCCAGGACAAACTCGGGTGTGGCACAAAGGGCTGGACGCCAGGCCAGGCCACGC
CAGAGACTGCAGAGAGGGCACCTGACCTAACCCCCCTGAAAGCCAATCTGCAGTCCCGTGTCCACCCA
CTCCTCCTGAGGACGCCATGCTCTGCCAGCCCTTCCAGGCTACCAGAGTAAACACCTTTGGC
CTTCGGTTGGTCTGGTCTCATCAGCCTCCAGAGTGTCCCTCATCGATTTTGGCTTGT
CCCCAATCCCAGGGCTGGAGGCACATCACCACATTGGAGGCTAACCTGTCACTAGTTACTAGGAGGTGCT
GGGAGCGCCGGGTTGGTGGTAACTCACTGCTCTAGCCTCTAACACTGCAGCCCCCTAA
TACAGTTCTCTGTTGGTGACTCCCACCCCCACACACACCCATAAAATTATTCGATGCTGTT
CATAACTGTAAAAAAAAAAAAAA SEQ ID NO:53

EXPANDED T243

Amino Acid Sequence

MESMSELLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLLRLPSKCEVCKYVAELKSAFEETG
KTKEVIDTGYGILDGKGSGVKYTKSDLRLIEVTETICKRLLDYSLHKERTGSNRFAKGMSSETFETLHN
HKGVKVVMIDIPYELWNETSAEVADLKKQCDVLVEEFEEVIEDWYRNHQEEDLTEFLCANHVLKGKDT
AERWSGKKGDIASLGGKSKKRSGVKGSSGSSKQRKELGLGEDANAEEEGVQKASPLPHSPPDEL
SEQ ID NO:54